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METEOROLOGICAL RESEARCH COMMITTEE

Transportable Anemometer for use with Mobile Meteorological Unit

by

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Mobile meteorological units require a remote indicating anemometer and wind vane which can be carried on a 30 foot support erected, if need be, at some distance from the mobile "Caravan". The support when packed for transport must be light enough and compact enough to be carried in the "Caravan"; it must be capable of being easily erected by not more than 5 men.

It was considered, and this has been confirmed by experience, that the standard cup generator anemometer Mk. Ib, and Wind Vane Mk.IIIa would be quite suitable for use with a mobile meteorological unit provided that a suitable support could be devised.

Four kinds of support were tried; first a standard R.A.F. aerial mast 30 ft. high made from 3 ft. 6 in. sections of 2 in. diameter steel tube, with push in spigot joints. This was very easy to put up by itself, but when a weight equivalent to the wind vane and anemometer was fastened to the top, the bending load on the mast while hauled up from the horizontal position was too great, and the mast buckled.

Next a telescopic steel tubular mast was designed and made in M.O.16. This consists of four lengths of steel tube of decreasing diameters which in the retracted position telescope inside each other. Each length can be extended from inside the next larger section by pulling on three wires passing over pulley blocks at the top of the section; when the section which is being extended has been pulled up as far as it will go (against a stop), the three wires are used as guy wires, besides holding up their particular section of the mast. The largest section has three extra guy wires to hold it upright while the second section is being pulled up and has a spiked base plate; a special fitting is provided to carry the anemometer with the wind vane above it on the top of the mast. The retracted length is $9\frac{1}{2}$ ft. and the weight about 120 lb.

To put it up, three guy wire anchoring posts are driven into the ground on a 30 ft. diameter circle about the position of the foot of the mast; anemometer, wind vane and electric wires are fastened to the top section, and the retracted mast is then raised to the vertical position and held there by the three fixed guy wires. Then the next three guy wires are pulled by three men, to raise the second section of the mast, and fastened to the posts. This process is repeated with the other two sets of three guy wires to raise the third and top sections of the mast.

On trial, omitting wiring up the instruments, erection took about 30 minutes, 5 of which were spent freeing a stuck pulley; and about the same time was taken to lower the mast and coil up the various wires. The chief disadvantages are (a) the whole mast when retracted is clumsy to handle because of all the guy wires hanging about and because of its weight; (b) it will be difficult to prevent rust, because pulling up and retracting will scrape off any form of rust-proof finish in time; steel tubing is necessary to give the required strength and the mast must be kept all in one for transport; (c) it is expensive in time to make. Four men are required to erect the mast.

The third support tried is a light alloy ladder, illustrated in Fig.1. It is made of 3 in. by 1¼ in. box section alloy sides and tubular rungs. It is in four sections each 8 ft. long, and jointed by channel section light alloy fish plates with long bolts passing right through the hollow rungs. This is a standard ladder obtained commercially, and weighs 91 lb; if desired, only one, two or three sections need be used. The fittings made in M.O.16 to go with it are a hinged base, top fittings to hold the anemometer and wind vane, and two sets of four guy wires with fittings and anchor posts.

The ladder is assembled on the ground, its foot attached to the hinged base and the instrument fittings attached to the top. The anemometer without its cups is fastened to its fittings. The anchor posts are driven into the ground at the corners of a square, each post 24 ft. from the foot of the ladder, and the guy wires are bolted to the ladder at the top and half way up. Five men are required to pull up the mast. Two pull on, say, the N.E. and S.E. guy wires while two men "walk up" the ladder, the fifth man steadying the N.W. and S.W. guy wires until the N.E. and S.E. guy wires can take the weight of the ladder; this is then manoeuvred into a vertical position by adjustment of the guy wires which are then made fast. The ladder is now quite firm and may be safely climbed.

The anemometer cups are carried up and put on their spindle and the wind vane is bolted to its tubular support. The anemometer is put on before pulling up the mast because it is on a side bracket where it is not so easy to get at when the mast is erected, whereas the wind vane support is directly over one leg of the ladder; also, the wind vane is rather heavy and would make it more difficult to pull up the ladder. Assembly and erection take about 40 minutes, and lowering and dismantling rather less. Handling is easy because each section weighs only about 20 lb., and the wires can be unbolted from the mast and coiled up separately. The ladder has been adopted as the most suitable ent support.

mainder of the anemograph consists of standard cup generator anemometer Mk.III(a) wind vane and dial, two drums of cable; and a 12 V. D.C. eeded for the wind vane, either by trickle charger if mains are r from batteries.

th type of support has recently been obtained and tried; this is ectional tower made from lengths of 1¾ x 1¾ x 3/16 inch light alloy was obtained from a firm who make servicing stages for aircraft, and from standard parts. It weighs about 2 cwt. and can be packed up e approximately 3 ft. 6 in. cube.

It takes much longer to erect and dismantle than the ladder, but has the advantage that it can be built up from the ground by one man without any help, given enough time, and can be taken down from the top by the reverse process; and it provides a platform to stand on, with a hand rail, which makes for easier attention to the instruments, without using a safety belt. The tower is shown in Fig.2.

The ladder formed part of the equipment of a mobile meteorological vehicle recently tried by 2nd T.A.F. No difficulty was found in putting it up and taking it down.

Some criticisms were made on matters of detail but these can easily be put right.

FIG. 1

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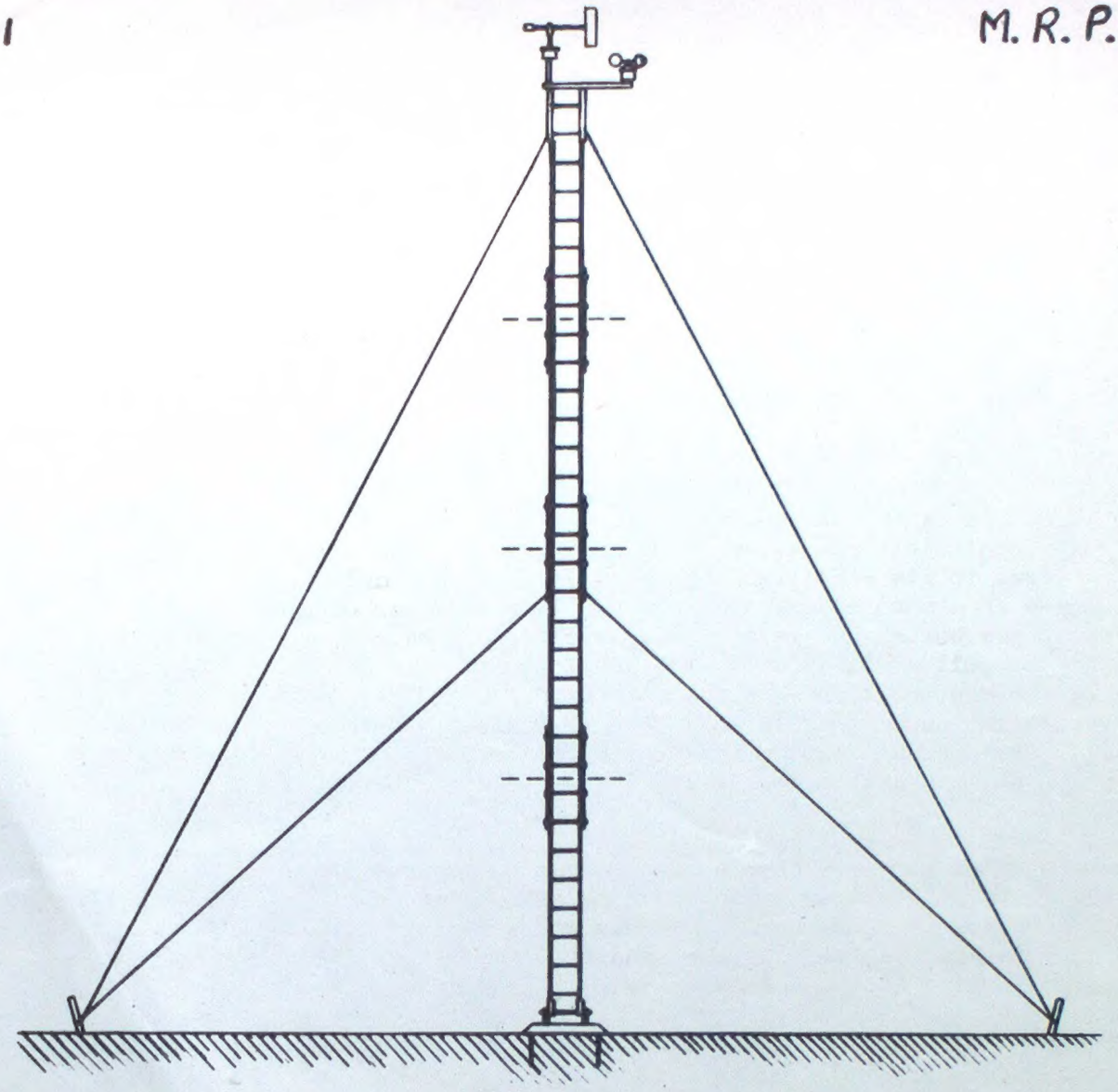

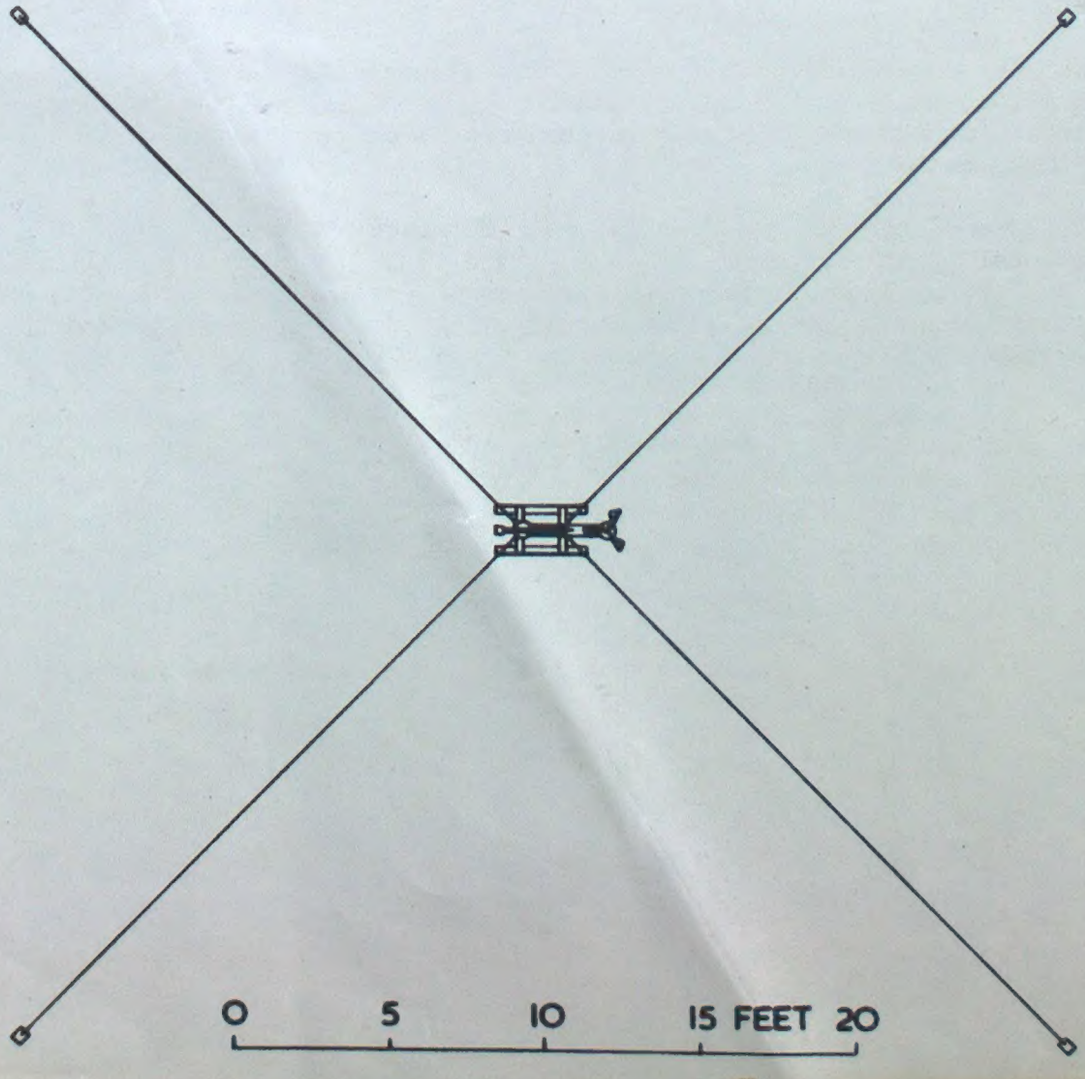

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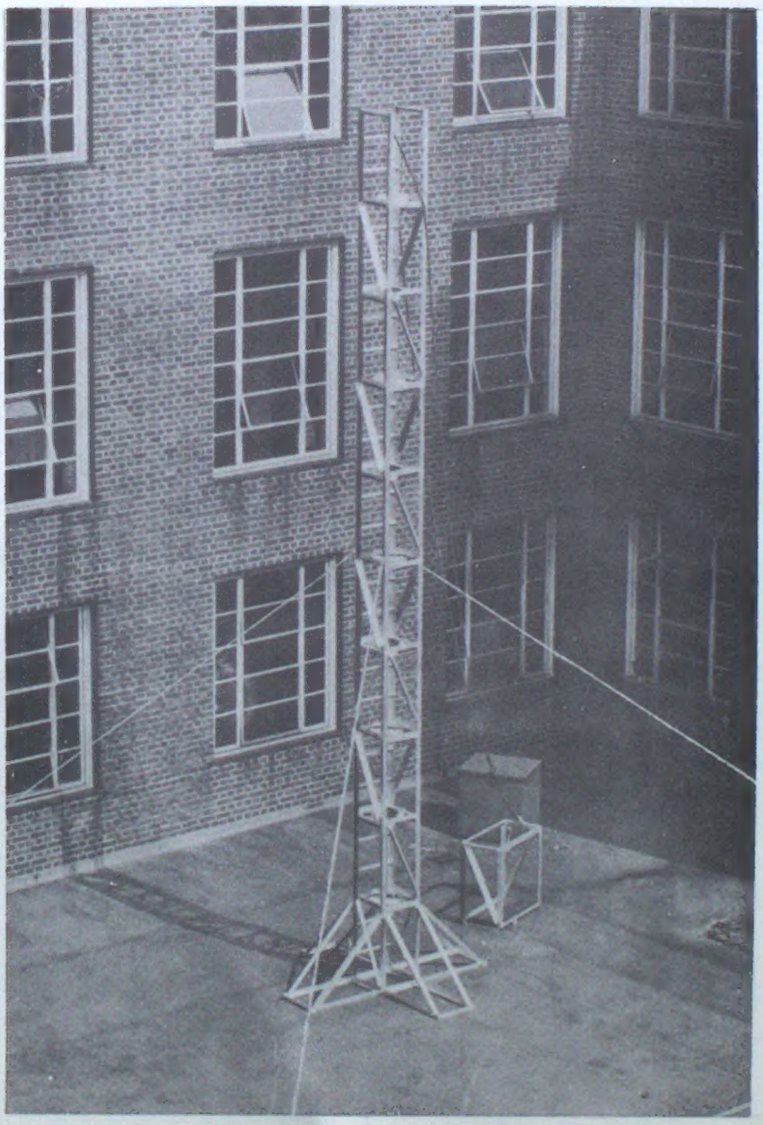

FIG. 2